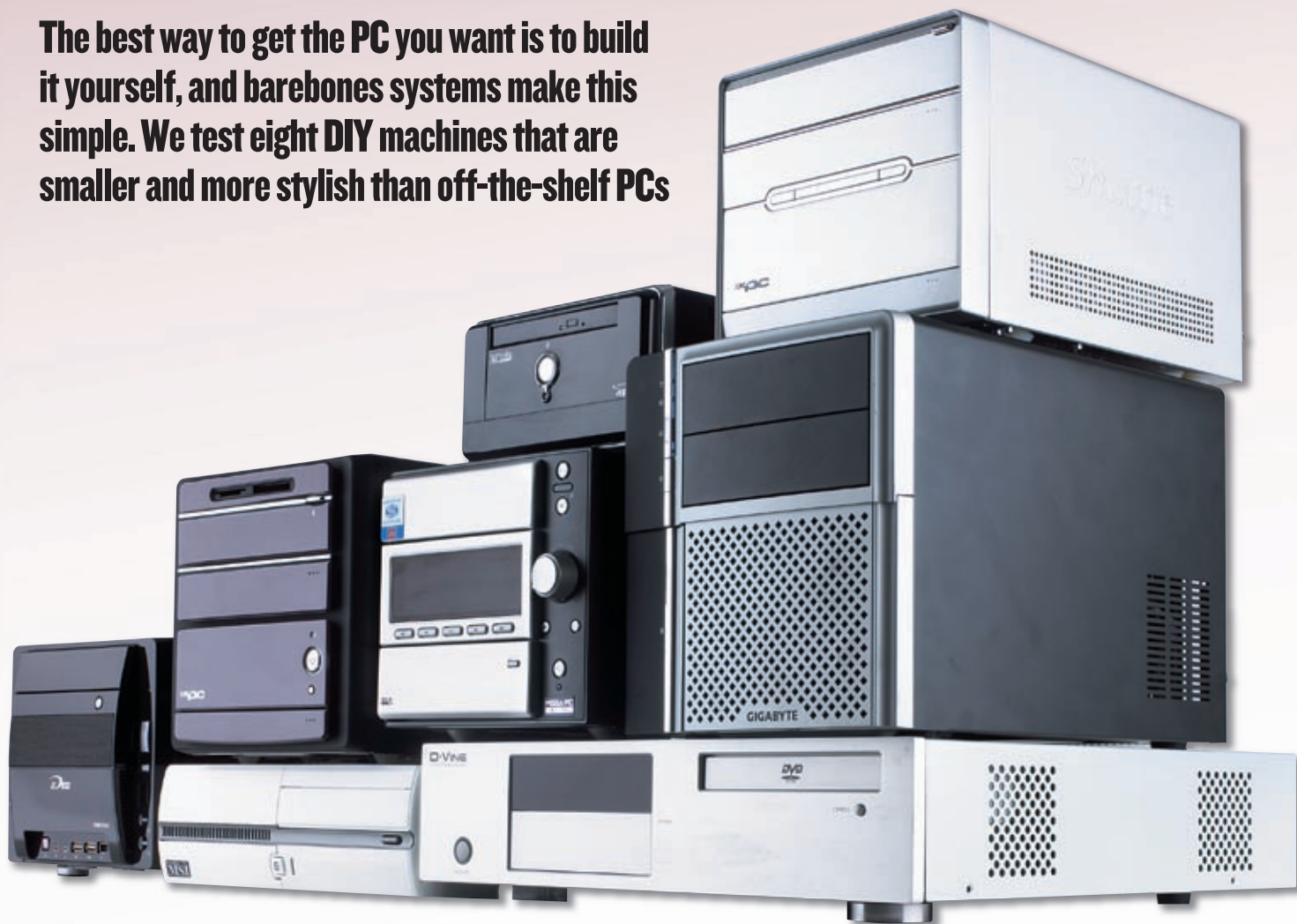




The best way to get the PC you want is to build it yourself, and barebones systems make this simple. We test eight DIY machines that are smaller and more stylish than off-the-shelf PCs



Barebones Systems

There are several advantages to building your own PC. You can buy exactly the components you need, choosing those that suit the way you'll use your computer and saving money by leaving out components you don't need. The problem is that building a computer from scratch can be a difficult and daunting task.

Barebones PCs make this process easier. They come partly assembled, with a motherboard and power supply installed in the case. They are also designed to be easy to build and come with

comprehensive instructions on how to put them together. They have other advantages, too, as most are smaller and more stylish than an average tower PC.

This month we asked eight manufacturers to supply us with barebones PCs. We were looking for three different types of system: those that would be good for building a quiet media centre PC, those that could form the basis of a gaming PC and those that would make a stylish home or office computer. Whatever type of PC you need, we'll help you find a barebones bargain.

IN THIS REVIEW

MEDIA CENTRE PCs

AOpen X-Cube MZ915-M
MSI Mega PC 865 Pro
Quiet PC Barebone Media Center

GAMING PCs

Biostar IDEQ 330P
Shuttle SN26P
Shuttle XPC ST20G5

OFFICE PCs

Gigabyte CB91
MSI Hetis 915 Lite



CHOOSING A... BAREBONES SYSTEM

A barebones system gives you the flexibility to design your own PC, but the type of motherboard and case you get dictates which components you can use. Here are some things to consider

In this article we've tested eight barebones PCs and organised them into three groups: those suitable for use as a quiet or media centre PC, those suitable for gaming and those that would make good general-purpose home or office PCs. Once you've decided which is for you, there are a few important decisions to make before buying.

BAREBONES NECESSITIES

Barebones PCs come with a motherboard, but it's still important to buy the right processor. There are processor socket types commonly used in barebones systems: Socket 939, 775 and 479. Socket 939 is compatible with AMD Athlon 64 processors, Socket 775 is for Celeron D or Pentium 4 chips and Socket 479 is for Intel's Celeron M and Pentium M mobile processors. The table on page 178 shows which processors each system supports.

Barebones systems also differ in the type of memory they accept. Six of the systems here take DDR memory, but the AOpen X-Cube and Quiet PC Media Center PCs need newer DDR2 RAM.

DRIVE TIME

Most barebones PCs are small, so it's important to consider how much room you need for parts and future upgrades. All the systems in this month's group have room for at least one hard disk and one optical drive, and four have an extra 3½" drive bay for a second hard disk. Gigabyte's CB91 has room for a second optical drive, but AOpen's X-Cube can accept only a single notebook-size optical drive.

You should also look carefully at each system's standard features. All the kits here have built-in sound and wired networking, but only six have integrated graphics and five have memory card readers. Not all have room for a PCI Express x16 or AGP graphics card, and in order to add a TV tuner to the AOpen X-Cube or the Quiet PC Barebone, you'll need to buy a special half-height card.

SLOT MACHINES

Even if you don't buy a gaming barebones system, you may want to play games occasionally. Six of



▲ As many barebones systems are small, they need several fans to keep their components cool

the motherboards in the group have integrated graphics chipsets that are good enough to handle older titles, but if you want to play modern games you'll need to upgrade. Six of the systems have PCI Express x16 slots for dedicated graphics cards, while one has an AGP slot for older cards. We tested all these systems with a Radeon X700 graphics card so you can see how well they perform with a mid-range £100 graphics card. Again, if you want to add a graphics card to the AOpen or Quiet PC systems, you'll need to buy a special half-height card.

PLUG AND PLAY

If you want to build a small gaming system, bear in mind that modern graphics cards need more power than the PCI Express slot alone can provide, so you'll need an extra six-pin PCI Express power connector. The Shuttle XPC ST20G5's power supply already has such a connector, but Biostar's IDEQ 330P doesn't. To use powerful graphics such as nVidia's GeForce 7800GTX in the Biostar system, you'll need a cable that converts two Molex plugs into one six-pin PCI Express plug, and a Molex extension lead that reaches the graphics card.

Shuttle's SN26P is designed to use two nVidia graphics cards connected together using SLI, but

there is only one PCI Express power connector and one spare Molex plug. To use SLI you'll need to buy a splitter that converts one Molex plug into two, and an adaptor that turns those two plugs into a PCI Express connector. You can buy all these cables from www.overclockers.co.uk.

COOL IT

A common problem with small cases is cooling. As the cases are so small, there is less room for hot air to dissipate, and the cases need powerful fans to expel hot air. These fans can be noisy at full speed, so most small cases have temperature-sensitive fans that come on only when needed. You can override automatic fan speeds in the motherboard's BIOS if you have problems with cooling, but with all the fans running constantly your PC will be noisy.

If you're building a media centre PC or you want a quiet PC, it's a good idea to buy a barebones system designed for a Pentium M processor. These chips are designed for notebooks, which means they use far less power than desktop processors and so produce less heat. As a result, Pentium M processors require smaller and quieter heatsink fans, and their cases need fewer fans to keep them cool.

KNUCKLE DOWN

Even when you know what you want your finished PC to do, you still have to put it together. All the systems here are fairly easy to assemble, but some were fiddly in places and others caused us some grazed knuckles and bruised egos. Our reviews explain which were easy and which caused us consternation. Finally, don't forget to have a few Phillips screwdrivers to hand before you start work.

HOW WE TESTED

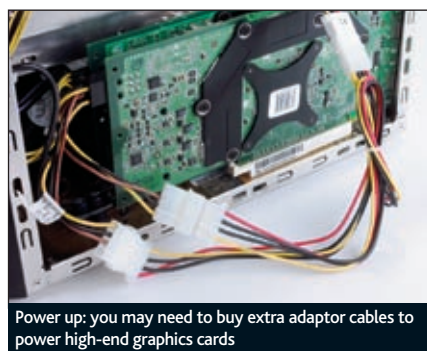
To make the test results as consistent as possible, we used the same or equivalent components when building each PC. We tested Socket 939 systems using an AMD Athlon 3500+ processor, and Socket 775 systems with a 3.6GHz Pentium 4 560. Socket 479 systems were tested with a 2.13GHz Pentium M processor. We fitted 1GB of DDR or DDR2 RAM.

Six systems have an integrated graphics chip, so we tested these using our standard 3DMark03 test. We also tested every system that has room for a PCI-E x16 or AGP graphics card with a Radeon X700 card.

We tested all the systems that are suitable for gaming with an nVidia GeForce 7800GTX card to see if they could cope with the heat it produces. Finally, we tested Shuttle's SN26P with two GeForce 7800GTX cards in SLI mode.



▲ Only some of the barebones systems have room for more than one hard disk



Power up: you may need to buy extra adaptor cables to power high-end graphics cards



REVIEW BAREBONES MEDIA CENTRE PC

AOPEN
X-Cube MZ915-M

RATING ★★★★★

PRICE £238 inc VAT

SUPPLIER www.dabs.comDETAILS www.aopen.com

AOpen's X-Cube is a half-height barebones system that's designed to use a Pentium M processor. As these use less power and produce less heat than desktop chips, the X-Cube is much quieter than most small systems.

The small case makes this system fiddlier to put together than the other barebones systems in the group. It's designed to use a notebook optical drive, and the kit comes with a drive faceplate that matches the case and a card that connects a notebook drive to a standard IDE connector. The instructions for customising the notebook's optical drive could be clearer, but fitting the hard disk and processor is easy.

The X-Cube has both S-video and D-sub outputs so it's easy to connect to an LCD or CRT TV. If you want to add a TV tuner you'll need to use a half-height PCI card or a USB adaptor, as there's no room in the case for a standard PCI card. Its score of 109 in our *Shopper* benchmarks was the best from the media centre systems on test. The integrated graphics will suffice for media centre use, but you could add a half-height PCI Express graphics card instead.

Although it is quite tricky to build, the X-Cube looks smart, makes little noise and would make a good media centre PC. It's not as expandable as the Quiet PC Media Center, but it is far cheaper.

✓ Stylish, quiet and very small

✗ Quite tricky to build; badly written instructions

SPECIFICATIONS Socket 479, Intel 915G PCI Express chipset, two DDR2 slots, one PCI slot (half-height), one PCI-E x16 slot (half-height), four SATA ports, one IDE port

REVIEW BAREBONES MEDIA CENTRE PC

QUIET PC
Barebone
Media Center

RATING ★★★★★

PRICE £434 inc VAT

SUPPLIER Quiet PC 0870 321 4620

DETAILS www.quietpc.com

Quiet PC's Barebone Media Center uses a relatively large case, which makes it easy to put together. You can fit three hard disks to store hours of video.

The Quiet PC system is designed for use with Windows Media Center Edition. The rear of the case has DVI, D-sub, S-video and component video outputs, so it can connect to almost any display. The case is also fitted with an LCD screen that provides CD and DVD track information.

The Quiet PC uses a low-voltage Pentium M processor. As the case also has a very quiet power supply, it makes hardly any noise. There are two half-height PCI slots and one half-height PCI Express x1 slot free for TV tuners.

Performance with our test 2.13GHz processor was understandably weaker than that of the Pentium 4 systems, but the Quiet PC scored a respectable 107 in our *Shopper* benchmarks and was powerful enough to play High Definition DivX video. The integrated graphics processor is powerful enough for media centre use, and you can add a half-height PCI Express x16 graphics card.

This is an incredibly quiet barebones Media Center system. At nearly twice the price of AOpen's impressive X-Cube, though, it's painfully expensive.

✓ Very quiet; lots of room for expansion

✗ Expensive

SPECIFICATIONS Socket 479, Intel 915G chipset, two DDR2 slots, two PCI slots (half-height), one PCI-E x1 slot (half-height), one PCI-E x16 slot (half-height), four SATA ports, one IDE port

REVIEW BAREBONES MEDIA CENTRE PC

MSI
Mega PC 865 Pro

RATING ★★★

PRICE £245 inc VAT

SUPPLIER www.st-athersystems.comDETAILS www.msi.com.tw

Rather than designing the Mega PC 865 Pro exclusively for Windows Media Center Edition, MSI supplies third-party media management software and its own remote control. A colour LCD readout on the front of the case shows CD and DVD playback information once you have installed the bundled software.

Two buttons activate AV and PC modes. The AV button boots the PC into a Linux-based playback system that works with the remote control, and the PC button takes you into Windows. The system also comes with InterVideo's Home Theatre software, which offers similar functions to Media Center and works with the remote. There's a spare PCI slot for an optional TV tuner card.

Building the Mega PC is easy as its parts are held together with clips rather than screws. The system is quiet while playing media files and discs, but gets quite noisy during intensive tasks. Its poor score of 104 in our *Shopper* benchmarks isn't surprising as it couldn't use our 3.6GHz test processor. We had to use a 3.4GHz chip instead. Its integrated graphics couldn't complete our 3DMark03 benchmark, and it accepts just AGP graphics cards.

With software and a remote control included, the Mega PC is an easy way to build a media PC. Its performance is very limited, though, so we'd recommend AOpen's X-Cube instead.

✓ Good accessories; well designed

✗ Outdated chipset; very limited graphics

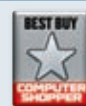
SPECIFICATIONS Socket 775, Intel 865G chipset, two DDR slots, one PCI slot, one AGP slot, one SATA port, two IDE ports

REVIEW BAREBONES GAMING PC

BIOSTAR
IDEQ 330P

RATING ★★★★★

PRICE £211 inc VAT

SUPPLIER www.microdirect.co.ukDETAILS www.biostar.com.tw

Biostar's IDEQ 330P is a well-designed system with good 3D performance. The interesting case design makes it extremely easy to assemble. The front of the chassis lifts up like a car bonnet and locks into position, giving easy access to the processor, memory and PCI Express slots.

The case is quiet when idling, but the fans make a loud hum during intensive work. Fortunately this noise is low pitched, so it's not too annoying. There's no built-in graphics, so you'll need to add a PCI-E x16 card to make it work. Unfortunately the power supply has no PCI-E power connector, so if you install a powerful graphics card, you'll need to buy a Molex-to-PCI-E power adaptor. This costs only a few pounds, but Biostar should have included one.

When fitted with our Radeon X700 graphics card the 330P performed similarly in our 3D tests to the other systems, but with a GeForce 7800GTX it produced an impressive score of 16,569. It's not so powerful in 2D tasks, though. Its score of 104 in our *Shopper* benchmarks was the joint worst in the group.

Biostar's IDEQ 330P is good value and very easy to build. It performs well in 3D tasks and doesn't suffer from the overheating problems that plague Shuttle's XPC ST20G5. Its 2D performance is mediocre, but if you want to play games, it's a great buy.

✓ Very easy to assemble; good value

✗ Disappointing 2D performance; no PCI-E power connector

SPECIFICATIONS Socket 939, nVidia nForce 4 chipset, two DDR slots, one PCI slot, one PCI-E x16 slot, two SATA ports, two IDE ports



REVIEW BAREBONES GAMING PC

SHUTTLE
XPC ST20G5

RATING ★★★★★

PRICE £239 inc VAT

SUPPLIER www.dabs.comDETAILS www.shuttle.com

Unlike the other barebones systems here that are suitable for gaming, the ST20G5 has a built-in graphics chip so you can also use it as a normal office PC. It takes longer to build than the IDEQ 330P as there are far more screws to remove, but installing the hard disk and optical drive is easy. The cables fasten neatly out of the way around the top of the chassis. Installing the memory is trickier, as there is a fan above the slots. This is the only system in the group that supplies SATA drivers on a floppy disk, so you will need a floppy disk drive handy when you install Windows.

The ST20G5 had no problems with our 3D tests when fitted with the Radeon X700 card, but the GeForce 7800GTX produced too much heat for the fans to cope with, leading to frequent crashes. The case's fans are temperature controlled and should speed up when the case gets too hot, but the only way we could keep the graphics card cool enough to run our tests was to set the fans to maximum speed in the BIOS. This made the PC very noisy all the time.

Shuttle's XPC ST20G5 is easy to build and, if fitted with a mid-range graphics card, would make a good general-purpose PC. Unfortunately, its cooling system just isn't up to working with the latest graphics cards, so it's unsuitable for gaming fans.



Tidy internal layout



Cooling problems when using 7800GTX graphics card

SPECIFICATIONS Socket 939, ATI Radeon Xpress 200 chipset, two DDR slots, one PCI slot, one PCI-E x16 slot, two SATA ports, one IDE port

REVIEW BAREBONES GAMING PC

SHUTTLE
SN26P

RATING ★★★★★

PRICE £404 inc VAT

SUPPLIER www.girotech.co.ukDETAILS www.shuttle.com

If you want the most powerful gaming PC available, two graphics cards are better than one. NVidia's SLI and ATI's Crossfire technology have been around for a while, but this is the first dual-card system we've seen inside a mini PC case. Older nVidia GeForce 6800 cards produce too much heat to work in the SN26P, but newer 7800GT and GTX cards should work without problems.

The SN26P has an excellent manual, so installing the components takes no time. The main problem is that the power supply has only one PCI-E connector. If you want to use two graphics cards in tandem you have to use two converters: one to turn a Molex power plug into two, and another to convert those two plugs into a PCI-E power connector. Unusually, there are no PCI or PCI-E x1 slots, so you can't add a PCI modem or TV tuner.

With a single 7800GTX graphics card the SN26P's 3D performance was comparable with that of the other gaming systems, but in SLI mode its scores of 26,382 in 3DMark03 and 104.5fps in Doom 3 were astounding. The system remained stable during a long gaming session, so the small case wasn't causing the graphics cards to overheat. If you must have a small SLI system, this is the one to buy, but most gamers would be better off saving a small fortune and buying Biostar's IDEQ 330P.



SLI gaming in a small case



Very expensive; only one PCI-E power connector

SPECIFICATIONS Socket 939, nVidia nForce 4 SLI chipset, two DDR slots, two PCI-E x16 slots, two SATA ports, one IDE port

REVIEW BAREBONES OFFICE PC

MSI
Hetis 915 Lite

RATING ★★★★★

PRICE £150 inc VAT

SUPPLIER www.refreshcomputers.comDETAILS www.msi.com.tw

MSI's Hetis 915 Lite is a budget Socket 775 barebones system. Its case is the largest in the group apart from that of the substantial Quiet PC Barebone Media Center (see page 173), so building it is no more fiddly than putting together a normal PC.

Although the case is large, there's room inside for only one hard disk and one optical drive. The case is half the height of a normal PC case, but the two PCI slots are mounted horizontally so you can use full-size PCI cards. There's no PCI Express x16 slot or AGP slot, though, so adding a powerful graphics card is out of the question. The system is generally quiet, but the side exhaust fan makes a lot of noise when running at full speed. The case can be mounted upright on the stand provided, but we found that this interfered with the cooling and overheated the processor.

When fitted with our test 3.6GHz Pentium 4 processor the 915 Lite shared the top spot in the *Shopper* benchmarks with the Gigabyte CB91, achieving a score of 128. The integrated graphics processor produced a decent score of 1,463 in the 3DMark03 test.

The Hetis 915 Lite is excellent value and would make a good PC for a home office. The CB91 isn't much more expensive, though, and has more room for upgrades.



Good value; decent 2D performance



Not much room for upgrades

SPECIFICATIONS Socket 775, Intel 915G chipset, two DDR slots, two PCI slots, two SATA ports, one IDE port

REVIEW BAREBONES OFFICE PC

GIGABYTE
CB91

RATING ★★★★★

PRICE £177 inc VAT

SUPPLIER www.fastekcomputers.co.ukDETAILS www.giga-byte.com

The Gigabyte CB91 uses the newer BTX case design, and it's the easiest system in this group to put together. The hinged case opens sideways, providing unobstructed access to the motherboard. The huge heatsink fits over the processor and blows air back over the integrated graphics chip through the back of the case for better cooling. There's room inside for one PCI card and one PCI Express x16 card.

The CB91 is ideal for building a home or office PC. It has room for two hard disks and two optical drives, so you could fit two DVD drives or a DVD writer and an LCD readout. It also has plenty of connectors, including six USB2 ports, two FireWire ports and a parallel port to connect older printers.

The CB91 performed well in Windows tasks. It shared the top spot in the *Shopper* benchmarks with a score of 128. Unfortunately it has some rather noisy fans and is especially loud during intensive tasks. It couldn't cope with the heat produced by an nVidia GeForce 7800GTX graphics card, so it's no good for serious gaming, but its integrated graphics chip is OK for office tasks.

The CB91 is powerful in Windows, easy to build and simple to upgrade. It's not ideal for gaming and won't make for a quiet media PC, but for an office or general-purpose computer it's very good value.



Very easy to assemble; plenty of room for upgrades



Fairly noisy; not suitable for the fastest 3D cards

SPECIFICATIONS Socket 775, Intel 915G PCI Express chipset, two DDR slots, one PCI slot, one PCI-E x16 slot, two SATA ports, one IDE port



BENCHMARKS

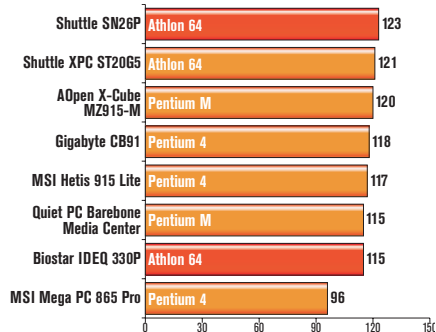
Integrated graphics

Radeon X700

GeForce 7800GTX

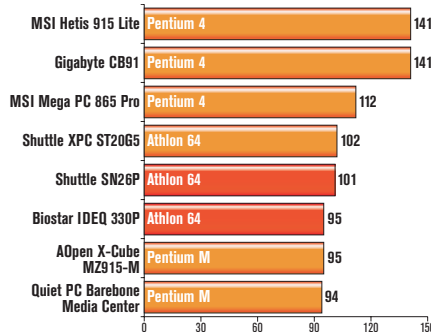
2D Performance **Shopper application tests**

Image-Editing Test



SETTINGS We run our application tests at 1,024x768 resolution and in 32-bit colour
WEB www.computershopper.co.uk

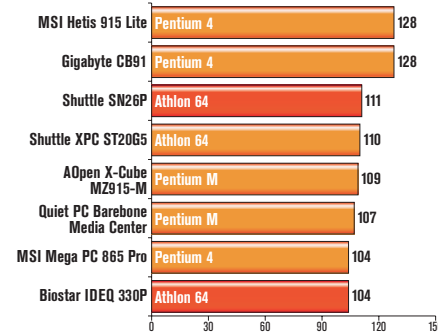
Video-Encoding Test



Shopper's 2D benchmarks show how PCs stand up to the toughest tasks Windows can throw at them. Today's PCs have no problem running office applications such as Word, so we focus our tests on areas where you could experience difficulties.

In version 1.0 there are three scripts. Our image-editing test simulates a session of photo enhancement using Paint Shop Pro, culminating in the memory-intensive composition of a panorama

Overall

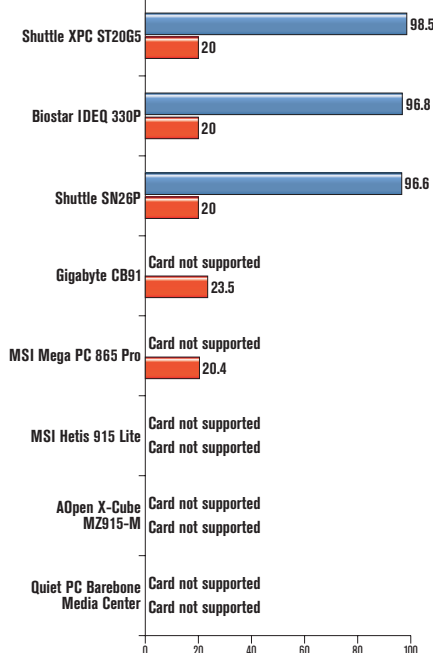


from a set of digital snaps. Encoding a short video to MPEG2 format is extremely processor-intensive, and anyone who's interested in transferring home videos to DVD will have to tackle this. Finally, a set of MP3s is generated by ripping an audio CD.

We compiled the tests with the help of our sister magazine for performance computing, *Custom PC*. Figures are relative to a reference Evesham Athlon 64 3500+ system, which scores 100 in all tests.

3D Performance **Doom 3/3DMark03**

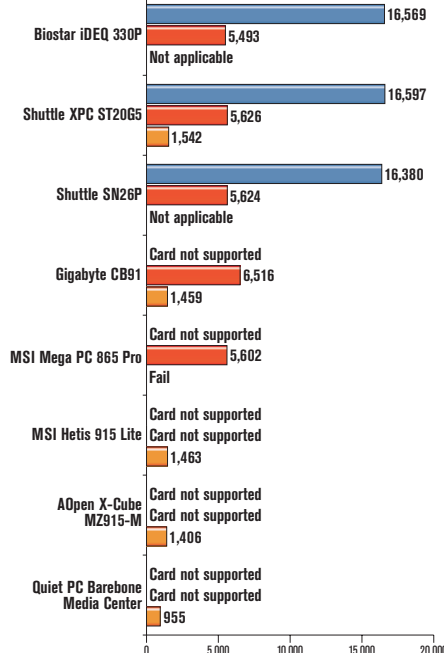
Doom 3 (fps)



SETTINGS 1,024x768 resolution, high quality, 4x AA
WEB www.doom3.com

We run a timed demo in Doom 3 to test whether a PC has the power needed to play cutting-edge 3D games with ease. A good score here means that it should cope with any graphically intense 3D game.

3DMark03



SETTINGS 1,024x768 resolution, 32-bit colour, default settings
WEB www.futuremark.com

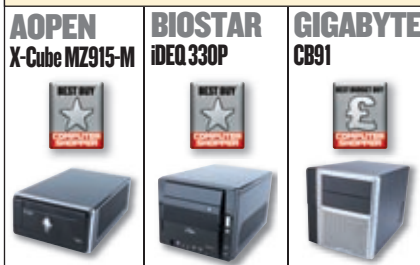
3DMark03 is Futuremark's 3D benchmark. It comprises four game tests from four different genres. The workload is representative of games coming on to the market now.

LABS VERDICT BAREBONES SYSTEMS

All the barebones systems were fairly easy to build, but there was a big difference in what you get for your money. Quiet PC's Barebone Media Center is a quiet system with plenty of storage space and video connections, but it's very expensive. AOpen's X-Cube is better value and much smaller, so if you want to build a media centre PC it's our Best Buy.

If you'd rather build a gaming PC, Shuttle's SN26P is tempting. Managing to cram a dual-card SLI graphics system into such a small case is a technical feat, but at the moment it's one that can be appreciated only by those with very deep pockets. Biostar's IDEQ 330P has good 3D performance and a superbly designed chassis at a bargain price and wins a Best Buy award.

MSI's Hetis 915 is the cheapest barebones system in the group and is a simple way to build a decent office PC. For just a few pounds more, though, you could buy Gigabyte's CB91. It's got a smart case with lots of room inside, and is the perfect choice for a smart home office computer. It's our Best Budget Buy.





MEDIA CENTRE

GAMING

OFFICE

MANUFACTURER	AOPEN 	MSI	QUIET PC	BIOSTAR 	SHUTTLE	SHUTTLE	MSI	GIGABYTE 
Model name	X-Cube MZ915-M	Mega PC 865 Pro	Barebone Media Center	IDEQ 330P	XPC ST20G5	SN26P	Hetis 915 Lite	CB91
Rating	★★★★★	★★★	★★★★	★★★★★	★★★	★★★★	★★★★	★★★★★
Processor socket	Socket 479	Socket 775	Socket 479	Socket 939	Socket 939	Socket 939	Socket 775	Socket 775
Processors supported	Celeron M, Pentium M	Celeron D, Pentium 4 (up to 3.4GHz)	Celeron M, Pentium M	Athlon 64, Athlon FX	Athlon 64, Athlon 64 X2, Athlon FX	Athlon 64, Athlon 64 X2, Athlon FX	Celeron D, Pentium 4	Celeron D, Pentium 4
Processor heatsink supplied	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory slots	2	2	2	2	2	2	2	2
Memory type	DDR2	DDR	DDR2	DDR	DDR	DDR	DDR	DDR
Maximum memory	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB
Motherboard chipset	Intel 915G	Intel 865G	Intel 915G	nVidia nForce 4	ATI Radeon Xpress 200	nVidia nForce 4 SLI	Intel 915G	Intel 915G
BIOS type	Phoenix Award	AMI	Phoenix Award	Phoenix Award	Phoenix Award	Phoenix Award	AMI	Phoenix Award
Integrated graphics (memory)	Intel 915G (128MB shared)	Intel 865G (96MB shared)	Intel 915G (128MB shared)	None	ATI Radeon Xpress 200 (128MB shared)	None	Intel 915G (128MB shared)	Intel 915G (128MB shared)
PORTS								
USB2 ports (front/rear)	2/2	2/4	0/4	2/4	2/2	2/4	2/4	2/4
FireWire ports (front/rear)	2/1	2/0	None	1/1	1/1	1/1	None	1/1
Legacy ports	2x PS/2, serial, parallel	2x PS/2, serial	None	2x PS/2, 2x serial	2x PS/2	Serial	2x PS/2, 2x serial	Parallel, 2x PS/2, serial
Graphics outputs	D-sub, S-video, composite, component on adaptor cable	D-sub	D-sub, DVI, S-video, component	None	D-sub, DVI	None	D-sub	D-sub
INTERNAL EXPANSION								
Case size (HxWxD)	196x101x320mm	207x170x334mm	428x93x408mm	212x180x335mm	176x196x291mm	200x218x314mm	309x94x366mm	237x224x335mm
PCI	1 (half-height)	1	2 (half-height)	1	1	None	2	1
PCI-E x1	None	None	1 (half-height)	None	None	None	None	None
PCI-E x16	1 (half-height)	N/A	1 (half-height)	1	1	2	None	1
AGP	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
Serial ATA ports	4	1	4	2	2	2	2	2
IDE ports	1	2	1	2	1	1	1	1
Floppy controller	Yes	No	No	Yes	Yes	Yes	No	No
Drive bays 3½"	1	1	3	2	2	1	1	2
Drive bays 5¼"	None	1	1	1	1	1	1	2
Other bays	Notebook optical drive bay	None	None	None	None	None	None	None
FEATURES								
LAN	10/100/1,000	10/100, 802.11b/g	10/100/1,000	10/100/1,000	10/100/1,000	10/100/1,000	10/100/1,000	10/100/1,000
Sound (ports)	Realtek High Definition Audio (optical S/PDIF in/out, minijack S/PDIF in, 5x analogue)	Realtek AC '97 (optical S/PDIF out, optical S/PDIF in, 5x analogue)	Intel High Definition Audio (minijack S/PDIF in/out, 5x analogue)	Realtek AC '97 (optical S/PDIF out, optical S/PDIF in, 5x analogue)	Realtek High Definition Audio (optical S/PDIF out, optical S/PDIF in, 5x analogue)	Envy24 Family Audio Controller (optical S/PDIF in/out, coaxial S/PDIF out, 5x analogue)	Realtek High Definition Audio (6x analogue)	C-Media High Definition Audio (minijack S/PDIF in/out, 5x analogue)
Surround sound channels	7.1	5.1	7.1	7.1	7.1	7.1	7.1	7.1
Card reader	MS/MS Pro/SM/SD/MMC	CF/MS/MS Pro/SM/SD/MMC	No	CF/MS/MS Pro/SM/SD/MMC	No	CF/MS/MS Pro/SM/SD/MMC	No	CF/MS/MS Pro/SM/SD/xD/MMC
Modem	No	Yes	No	No	No	No	No	No
Integrated power supply	Yes	Yes	No (quiet PSU included)	Yes	Yes	Yes	Yes	Yes
Cables included	SATA, IDE, S-video/composite/component output lead	SATA, 2x IDE	SATA, IDE	SATA, IDE	2x SATA, 2x IDE, floppy	SATA, 2x IDE	SATA, IDE	SATA, IDE
BUYING INFORMATION								
Price including VAT	£238	£245	£434	£211	£239	£404	£150	£177
Price excluding VAT	£203	£209	£369	£180	£203	£344	£128	£151
Supplier	Dabs	St-Athersystems	Quiet PC	Micro Direct	Dabs	Girotech	Refresh Computers	Fastek Computers
Phone	N/A	N/A	08703 214620	08704 444456	N/A	08702 422536	023 9226 2900	08452 608998
Web	www.dabs.com	www.st-ather-systems.com	www.quietpc.com	www.microdirect.co.uk	www.dabs.com	www.girotech.co.uk	www.refresh-computers.com	www.fastek-computers.co.uk
Details	www.aopen.com	www.msi.com.tw	www.quietpc.com	www.biostar.com.tw	www.shuttle.com	www.shuttle.com	www.msi.com.tw	www.giga-byte.com